



Your source for top-quality DDR...

crucial
 TECHNOLOGY
 A Division of Micron

FREE SHIPPING!

www.crucial.com

EXTREMETECH

HOME | MY EXTREMETECH | SIGN IN

Already a Member? Sign in Not a member? Join Now.

CORE
PC TECH3D GRAPHICS,
AUDIO & VIDEO

BUILD IT

OS
& SOFTWARENETWORKING
& SECURITY

SHOP NOW

DISCUSSIONS

3D Graphics | Audio | Toys and Peripherals | **Displays** | Photo/Video[Home](#) > [3D Graphics, Audio & Video](#) > [Displays](#) > Projection Display Technology

Projection Display Technology

[Discuss this now \(3 posts\)](#)

SIDEBAR: A New Field-Sequential Color Approach

In June 2001 at the Society for Information Display (SID) meeting in San Jose, Philips Components unveiled a new LCOS chip designed for projection applications. Even more interesting than the chip itself was the reference design the company created to demonstrate a single-chip LCOS reflective-LCD projector using field-sequential color illumination (instead of three LCOS panels as in most LCOS designs, as noted in our main story).

Instead of using a color wheel, the projector uses beam splitters to separate the light from the lamp into red, green, and blue beams. These are then directed at rectangular prisms that are spinning on their long axes.

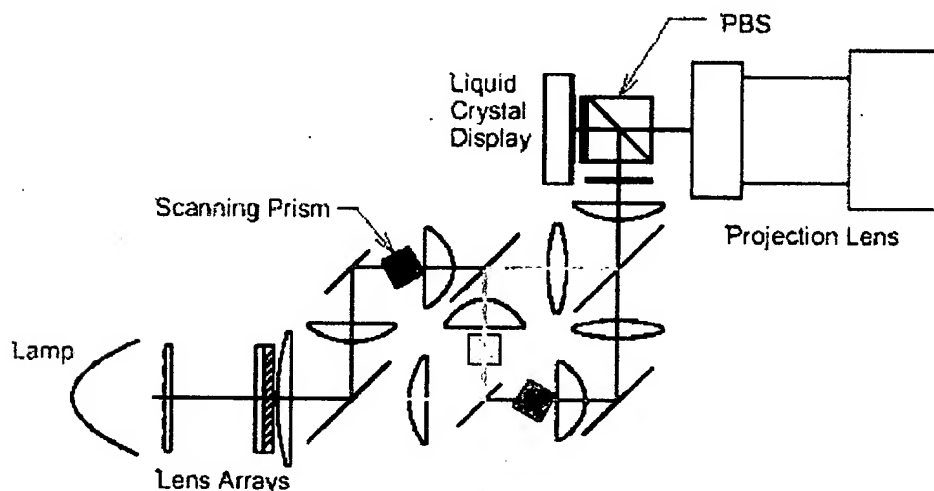


Figure is from "Single panel reflective LCD projector", Jeffrey A. Shimizu, Philips Research

The light from these three prisms is then focused on a polarizing beam splitter that directs the light at the single LCOS chip, where it is then reflected back through the splitter and into the projection lens.

The key to this system is that each light beam only illuminates one third of the panel at a time. In a system Philips calls "scrolling color", the bands of colored light moves

TECHNOLOGY NEWS

[more >](#)

- 5:34PM
- [802.11g WLAN Spec Just About Done](#)
- 5:17PM
- [AOL 9.0 Beta Released](#)
- 4:18PM
- [HP Hops on 'Springdale' Bandwagon](#)
- 8:17AM
- [Wiretap Law to Fight Terrorism Used in Other Ways](#)
- 6:46AM
- [TIA Gets New Name, Old Questions Persist](#)

[ExtremeTech Headlines in RSS](#)

TOP SELLERS

[more >](#)This Week's Most Popular **DIGITAL CAMERAS**:[High End: Canon EOS 10D](#)[High End: Fuji Finepix S2 Pro](#)[Value: Nikon Coolpix 2500](#)[Value: Olympus D-520 Zoom](#)

TOP TIP

[more >](#)[New DIY box won't boot!](#)

HOT STORIES

- [Intuit story on removing DRM](#)
- [Keyboard Kraziness & Mouse Madness](#)
- [The BSDs: Sophisticated, Powerful](#)
- [19 Extreme Windows Tips](#)
- [Top Performance: Build or Buy?](#)

OPINION

[more >](#)[Lloyd Case: Waiting For Godot](#)READER SUBMITTED
ARTICLES[more >](#)

- [Read Great Stories from our Readers!](#)

EXTREMETECH INDEX

[more >](#)[Hundreds of stories—ET at a glance.](#)

TOP DISCUSSIONS

[more >](#)

'rapidly across the face of the panel, which adjusts to display the correct image for that color as the light passes over it. As soon as one color band starts to "fall off" the end of the panel, the rotation of the prism causes it to reappear at the other edge of the panel.

This may sound like a particularly complex design, but according to Philips engineers, it is a surprisingly forgiving design to assemble and adjust. They used a hard disk drive motor running at one-tenth its design speed, and only one-tenth the operating load, yet it produces 180 Hz color fields, which projects each color three times per 60 Hz frame. Alignment of the light beams need not be nearly as precise as in three-panel designs, which also lowers assembly costs.

The big advantage, however, is in light efficiency. A DLP projector's color wheel creates the color by filtering the light. This means that two-thirds of the light is lost when projecting each color. Even the addition of a fourth, clear segment still means that two-thirds of the light is lost for three-fourths of the time. In contrast, the full light beam is split into three parts in the Philips design, and then each of these beams is concentrated on one-third of the panel. In other words, all the light reaches the panel. As a result, a projector with the Philips scrolling color should be as much as twice as bright as color wheel designs with the same lamp and panel.





Philips does not plan to produce this projector imaging engine, but instead created it as a reference design to be used by customers for its LCOS display panel. At present, no projectors using this design have been announced, but it will be interesting to see how they perform when they do come to market.

[< back](#)

TABLE OF CONTENTS

- [Introduction](#)
- [Light Source](#)
- [Optics](#)
- [The Image Engine](#)
- [Reflective Panels](#)
- [The Screen](#)
- [Projecting the Future](#)
- [SIDEBAR: A New Field-Sequential Color Approach](#)

OPTIONS

-  [Save this article](#)
-  [Discuss \(3 posts\)](#)
-  [Print](#)
-  [E-mail](#)

FREE ONLINE SEMINARS FOR EXECUTIVES AND IT PROFESSIONALS

- [04/24 - Data Protection and the Vision Splendid](#) with Michael Krieger. *Sponsored by BakBone Software.*
- [05/07 - The Path to Network ROI](#) with Frank Derfler. *Sponsored by SmartPipes.*
- [05/15 - Simple Storage for a Complicated World: Maximizing Resources to Face Today's Business Challenges](#) with Michael Krieger. *Sponsored by Iomega & Microsoft.*
[view more eSeminars >>](#)

NEW PCMag UTILITY!

Download the Latest PC Magazine Utility: PC Magazine Media Console

When you want to browse and play back video, music and photographs, the **PC Magazine Media Console** makes your PC as easy and intuitive to use as a TV or TiVo/PVR. Even better, it **clearly displays your system's output on a TV**, with fonts you can read from across the room -- and **works with PC**

TECH SHOP @ EXTREMETECH

Shop ExtremeTech's **Tech Shop** for the **BEST PRICES** on **Notebook Computers**.

Top Selling Notebooks:

- [ECS i-Buddie 4](#)
- [Sony Vaio GRX 670](#)
- [Toshiba Satellite 1415-S173](#)
- [IBM ThinkPad 600X](#)

- [E3: The Return of PC Gaming](#)
- [OSI Tears Apart SCO's Claims](#)
- [Poll: Best Linux mail client?](#)
- [Poll: Catalyst 3.4's...Good or bad?](#)
- [Tacoda launch by executive of Real Media](#)

WHITE PAPER LIBRARY [more >](#)

New: hundreds of white papers and reports on vendors and technologies.

- [3G Wireless](#)
- [Digital Imaging](#)
- [Microprocessors](#)
- [Networking](#)
- [Operating Systems](#)
- [Security](#)
- [Storage](#)
- [See All Categories](#)

NEWSLETTERS

Get ExtremeTech's FREE online newsletters.

- ☒ [ExtremeTech Weekly](#)
- ☒ [Build It](#)
- ☒ [ExtremeTech Advanced Architecture](#)

Preferred e-mail format:

[View all newsletters >](#)

> FREE ONLINE SEMINARS FOR IT PROFESSIONALS

[05/15 - Simple Storage for a Complicated World: Maximizing Resources](#)
[The Perfect PC: What to Look For](#)

ADVERTISING PARTNER SERVICES

[Dell Showcase](#)
[Dell Desktops](#)
[Dell Notebooks](#)
[Click here for MPC \(MicronPC\)](#)

remote controls, other wireless input devices.
Ideal if your PC doubles as an entertainment system!

- [Apple PowerBook G4](#)

[Read More and Download it Now!](#)

[More PCMag Utilities >>](#)

[More Notebooks >>](#)

MARKETPLACE

\$13.95 / yr - Domain Name Registrations

Reserve a .com, .net, .org web address here and get free url forwarding with masking, managed dns services such as IP, MX, and CNAME pointing for free with every registration here.

Buy LCD TV's and Plasma Displays on sale at Dbuys.com

Shop with confidence! At Dbuys.com All products we carry are brand new, factory sealed, and come supplied with a full manufacturers USA warranty.

Quality monitor cables for less!

CablesAmerica offers high-quality monitor cables for less. Check out our large selection of DVI, double-shielded HD15, 13W3 and more.

\$8.95 Domain Names from Go Daddy Software

.COM, NET, ORG for only \$8.95. Domain transfers just \$7.75. FREE parked page, domain forwarding, locking & more. Advanced domain control center & FREE DNS management. ICANN accredited, #1 in net new names.

[Get your product or service listed here.](#)

[Dell Home Solutions Center](#)

[Shop Now! - Dell Home Solutions Center](#)

[Build your custom desktop at MPC \(MicronPC\)!](#)

SPONSORS

[Free 3-5 day Shipping w/ Dell™ Home System. Details.](#)

[See the Tablet PC in action](#)

[WebSphere Software](#)

[FREE performance boost. Find out what you're MISSING.](#)

[\\$64 for ValueRam 512MB DDR PC2100 Direct from Kingston, Plus Free 2nd Day Shipping! Shop.kingston.com](#)

[The new GeForce FX 5900 - Experience insane speeds at high resolutions and cinematic effects for next-generation games.](#)

[Stay in the loop with the HP iPAQ Pocket PC h5450.](#)

[ExtremeTech: Customer Service](#) | [Contact Us](#) | [About](#) | [Advertise](#)

[Ziff Davis Media: Home](#) | [Contact Us](#) | [Advertise](#) | [Magazine Subscriptions](#) | [Newsletters](#) | [RSS Feeds](#) | [White Papers](#) | [Tech Shop](#)
[Baseline](#) | [CIO Insight](#) | [Computer Gaming World](#) | [Electronic Gaming Monthly](#) | [eSeminars](#) | [eWEEK](#)

[ExtremeTech](#) | [GameNOW](#) | [Microsoft Watch](#) | [Official US PlayStation Magazine](#) | [PC Magazine](#)

[Supersites: Security](#) | [Storage](#) | [Wireless](#)

[Privacy Policy](#) | [Terms of Use](#)

Copyright (c) 2001-2003: Ziff Davis Media Inc. All rights reserved.

ExtremeTech is a trademark of Ziff Davis Publishing Holdings Inc.

Reproduction in whole or in part in any form or medium without express written permission of Ziff Davis Media Inc. is prohibited.
For reprint information: [click here.](#)

12